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THE MINES HANDBOOK

SUCCEEDING

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Founded by Horace J. Stevens, 1900

DESCRIBING
THE MINING COMPANIES OF THE
TWO AMERICAN CONTINENTS

BY
LENOX H. RAND
EDWARD B. STURGIS

ARTHUR LAKES LIBRARY
COLORADO SCHOOL of MINES
GOLDEN, COLORADO

VOL. XVIII (1931 Issue)

IN TWO PARTS

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FAIRVIEW MINING CORPORATION**COLORADO**

Address: Frank M. Holmes, 225 First Nat. Bank Bldg., Denver, Colo.

Mine address: W. H. Webber, mgr., Nederland, Colo.

Officers: John E. Bergen, pres.; W. H. Winterbotham, v. p.; F. M. Holmes, sec.-treas.; with Orvill Beal, Leon Kepler, B. F. Hastings and Hugo Eymann, directors.

History and capitalization: INC. in Colorado. Has a bond and lease on the Boulder county mine and tunnel, which was formerly operated by the now defunct Caribou Metals Co. Involved in litigation with American Mines & Smelting Co., which see. Also operated the Fairview mine since 1922 and the Gilpin County mine in 1922. CAP: \$500,000; \$1 par; 140,000 treasury shares. Operating expenses in 1925 were \$110,000 and receipts from ore sales \$45,000. Annual meeting in January. Stock transferred at company's office.

Property: 25 claims (15 patented), about 450 acres, at Cardinal, Grand Island district, Boulder county. Ore occurs in quartz vein in schist and carries gold, silver, lead and zinc.

Development: by a 150' shaft and 5,900' Boulder County main tunnel, of which 3,200' is crosscut, to a depth of 1,200'. Workings total about 10,000'. Ore reserves show 28,000 tons of \$10 to \$15 ore blocked out and 500,000 tons of possible ore.

Equipment: includes electric power, 753 cu. ft. compressor, hoist and 150-ton concentration mill, using selective flotation. About 58 men were employed.

Through 1927 and 1928 company operated steadily and made regular shipments. Litigation in 1929 halted operations. We have been unable to get direct information as to company's present condition and plans for the future.

FALCON LEAD MINING CO.**COLORADO**

Address: A. W. Grimley, Packer Bldg., Philadelphia, Pa. Mine address: R. L. Pellet, v. p.-gen. mgr., Rico, Colo.

Officers: Frederick Bradshaw, pres.; Robt. L. Pellet, 1st v. p.; Jas. C. Rogers, 2d v. p.; A. W. Grimley, sec.-treas.; M. Randell, asst. sec.-treas.; with J. P. Brock, M. B. Cutter, H. C. Gibson, C. A. Heller, S. D. Sinkler, Geo. P. Smith, C. B. Taylor, Wm. H. Smith and Erastus T. Tefft, directors.

History and capitalization: INC. May, 1924, by interests closely allied with Tonopah Belmont Dev. Co. to take bond and lease on part of property of Syndicate Mng. & Mfg., which see. CAP. \$3,000,000; \$1 par. Listed on New York Curb, Aug. 11, 1926. The price range of shares was high 90c in 1926; low 5c. in 1928. In 1929, high 64c.; low 10c.; last 12½c.

Property: 156 claims, 1,110 acres, with 20-acre mill site and 320 acres coal land, in the Pioneer district, Dolores county, includes the Yellow Jacket-Phoenix group, Nora, Lilley and Falcon mines. Ore occurs in fissure veins as lime replacements. Veins are reported to vary from a few inches to 15' in width, traceable for a mile and to be proven to a depth of 700'. In one mine the ores carry 4% copper, 10% lead, 10% zinc and 10 oz. silver, and occur as chalcopyrite associated with pyrite, sphalerite and galena in fluoritic gangue.

Development: by tunnels, 1,000' to 3,000' long, cross-cuts, drifts and winzes.

Equipment: includes 125-h. p. hydro-electric plant at mine and 100-h. p. at mill, two 75-h. p. hoists, 2 compound air-compressors, 10 drills and mill, using two 9 by 15" Blake crushers, 18 Wilfley tables, flotation cells, etc.

Production: up to 1918 estimated at 1,200,000 lb. copper.

In 1926, company had a contract to ship 100 tons of ore daily to International Smelting Co. at Rico. Shipments were being made at this rate in late-1926 and part of 1927, when a general faulting system, interrupting the important orebodies, was encountered. Only desultory development work was done from then until late-1928 when an active campaign to discover the faulted extension of the orebodies was announced. The reported discovery of a body of high-grade gold-silver ore in February, 1929, is the last word received.

P & E LEASING SYNDICATE**COLORADO**

Address: Herman Emperius, pres., Alamosa, Colo. Organized in late-1928 by Herman Emperius, B. T. Poxson of Denver and J. D. Fisher of Colorado Springs to operate leases on part of the Amethyst and the Pittsburgh and the Last Chance, Del Monte, Aspen and Ruth Elder properties in the Creede district, Mineral county. (See Amethyst Lease and Morgan & Sloan). Development work, with incidental shipments in 1929, showed some orebodies high in silver and lead but small in extent.

PELLEYRE MINING & MILLING CO.**COLORADO**

Controlled by International Smelting Co.

Address: 818 Kearns Bldg., Salt Lake City, Utah. Mine address: D. E. Loughren, Rico, Colo.

Inc. in 1926, to acquire part of holdings of Syndicate Mng. & Mlg. Co. (q.v.), on Newman hill and Shamrock and Atlantic Cable mines on the W side of Dolores river, all in Pioneer district, Dolores county, at Rico. Ore carries lead, zinc, copper, silver and gold. Developed by shaft and tunnels.

Operations were started in late-1926 and company was still reported among the producers in 1929.

PENNSYLVANIA MINES CO.**COLORADO**

Address: W. E. Slaughenhoupt, 1314 Farmers Bank Bldg., Pittsburgh, Pa. Mine address: J. Van Damm, mgr., Ouray, Colo.

Officers: J. E. Johnston, pres.; James B. Clar, v. p.; W. E. Slaughenhoupt, treas.; D. McAllister, sec., with B. H. Jones, James S. Seabee and J. P. Kerr, directors.

History: incorporated 1923, in South Dakota, to take over the assets of the Ouray Union M. & M. Co. (q.v.).

Capitalization: \$1,500,000; \$1 par; 1,000,000 shares issued. Registrar and transfer agent, Registrar & Transfer Co., New York.

Property: the Wanakah and Bright Diamond mines, 34 claims, 300 acres, in Uncompahgre district, Ouray county. Ore is pyritic and carries gold, silver and copper. Developed by tunnels with 10,000' of workings. Engineer's report stated that there were 160,000 tons of ore blocked out with average value of \$10 per ton.

Equipment: includes electric power, compressor and remodeled Wanakah mill, employing stamps, tube-mill, tables and 1 Ruth flotation unit. A 50-ton Maca smelter was installed in 1924.

Comment: inactive 1926 and presumably since.

PENNSYLVANIA MNG., PWR. & REDUCTION CO.**COLORADO**

Address: Leopold Sternberger, mgr., 307 Edgehill road, East Milton, Mass., G. L. Levi, v. p.-sec.

Inc. 1910 in Colorado. Cap. \$2,500,000; 600,000 shares in the treasury. Is a close corporation, owned by Leopold Sternberger and Estate of Samuel Sternberger. Owns entire stock issue of the Fall River Hydro Electric Power Co.; also the Lotus group of mines and property formerly held by Lucania Tunnels & Mines Co.

Property: lies between Fall River and Central City, Clear Creek and Gilpin counties, and includes the Pennsylvania group, 374 patented claims, including several mill sites and placers, covering about 2,500 acres. Shows fissure veins with complex lead-zinc-copper ore, containing silver and gold, also uranium, molybdenum and tungsten.

Development: by shafts and adits, about 8 miles in all; including the 6,400' Lucania tunnel.

Equipment: includes steam and hydroelectric plants, air compressors.

Several of the mines have been good producers in the past. Mine was operated in 1927 by E. C. Hartman, Central City. Property is for sale.

PENNSYLVANIA MOLYBDENUM MINES CO.**COLORADO**

Address: J. A. Sloan, sec., 220 Tioga Ave., Johnstown, Pa. Idle since 1919. Described in Vol. XVI.

PENROSE MINES, INC.**COLORADO**

Address: C. J. Walker, Boatman's Bank Bldg., St. Louis, Mo. Mine address: Jesse F. McDonald, Leadville, Colo.

Company operated and produced 1919 to latter part of 1922, when property was subleased to the Midnight Mng. Co., which see.

RICHMOND MINE (WEST)

COLORADO

Address: H. H. McDaniel, Salina, Colo., who operated this gold-silver mine in the Gold Hill district, Boulder county, in 1921-23. Was controlled by now defunct Interstate Metals Co. in 1919 and 50-ton flotation plant built, which has since been dismantled and moved. Mine idle because of lack of funds.

RICO ARGENTINE MINING CO.

COLORADO

Address: 539 Atlas Block, Salt Lake City, Utah. Mine address: H. L. Worcester, supt., Rico, Colo.

Officers: F. W. Price, pres.-gen. mgr.; J. E. Frick, v. p.; J. H. Woodman-sec, sec.-treas., with Geo. Baglin, J. E. McKnight, and A. E. Rykert, directors.

History and capitalization: INC. 1912, in Utah. In 1918, the Rico Cons. Mines Co. brought suit against this company and the Marmatite Mng. & Leas. Co. (defunct) over apex rights for wrongful extraction of 15,000 tons of ore, worth \$900,000. In 1921, judgment was rendered against the Rico Argentine and the Marmatite, but decision was reversed in 1923 by the Colorado Supreme Court and a new trial ordered, which never came up, and case has now been disposed of entirely. CAP. \$100,000; 10c. par; 750,000 shares outstanding; assessable; assessment of 1c. per share was pending in November 1924. Company is its own transfer agent and registrar. Listed on Salt Lake Exchange, price range in 1929 being 50c. in March to 15c. in December. DIVIDENDS: quarterly, 3c. per share, Dec. 15, 1927 to Dec. 15, 1928 inclusive.

Property: the Blackhawk and Argentine groups, 21 claims, 145 acres, mostly patented, in Pioneer district, Dolores county, adjoining the Rico-Wellington and Rico Cons. properties.

Geology: alternating strata of limestone and sandstone, dipping at angle of about 30° and cut by almost vertical fissures of great extent and persistence. Where these fissures cross the soluble limestone they contain flat replacement deposits of sulphide ores, carrying copper, zinc, and lead, with gold and silver values. The ore shoots or bedded deposits are from 3-30' thick; 15 limestone beds, believed to be ore-bearing, are known to exist above the Blaine tunnel level. These fissures and the limestone are identical both in character and occurrence with those which are producing in the Rico-Wellington property. In the apex suit with the Rico Consolidated, the Rico Argentine held that the Blackhawk fissure was the source of the enrichment of the beds that had been followed into the disputed ground; in other words, it was the master vein. Judge Searcy decided January, 1921, that the ore-beds were formed by EW fissures rather than by the Blackhawk. This reverses the generally accepted local theory.

Development: by 3 tunnels, Log Cabin, Argentine, Blaine. In 1918, it was reported that bismuth was appearing in some of the ore. A tunnel was driven 700' in the ground in dispute with the Rico Cons. and opened silver-lead-copper shipping ore.

Production: for 1917, \$100,000, the net smelter returns of which were \$88,837. Of this, \$47,576 was for ore shipped by company and \$41,261, shipped by lessees. On January 1, 1919, company operations were suspended until September, but lessees continued shipping at rate of 1,000 tons per month. Company resumed operations on Dec. 1, 1924, and shipments have been fairly regular since, during 1928-29 at rate of about 100 tons per day. Ore was sent to the smelter at Midvale, Utah, except in 1926-27 when it was treated in the flotation mill of Int. Smltg. Co., at Rico.

RICO CONSOLIDATED MINES CO.

COLORADO

Controlled by Knight Investment Co., 11 Knight Block, Provo, Utah. Mine address: Rico, Colo.

In 1918, company brought suit against the Rico Argentine Mng. Co. and the Marmatite Mng. & Leas. Co. (defunct) over apex right. See Rico Argentine for particulars.

Property: in Pioneer district, Dolores county, adjoining the Rico Argentin-

tine on the NE, shows a vein of copper-silver-lead ore 35' wide in the upper workings. For geology see the Rico Argentine.

Development: by tunnel over 300' long. Shipments have been made, but no figures are available.

Rico Mng. & Red. Co. had a bond and lease on this property in 1925, but has since relinquished it. Idle except for small amount of prospect work by a lessee.

RICO ENTERPRISE MINING CO.

COLORADO

Address: Robt. L. Pellett, pres.-mgr., Rico, Colo.

Inc. circa April 1927, in Colorado. Cap. \$100,000.

Property: about 100 claims on Newman hill and Dolores Mtn., in Dolores county at Rico. Ore carries gold, silver, lead, copper and zinc.

Developed: by several tunnels, including 1,800' Revenue and Pro Patria, drifts, raises and stopes.

Equipment: includes electric power, compressor and tramway.

Comment: in 1927, development only was done; in 1928, development was continued with shipment of 5,000 tons of ore averaging \$20 per ton; the shipment of 20 cars of ore in March 1929, was also reported. A rock slide on D. R. G. & S. Ry. in April, 1929, which was not cleared by end of year, required shipment by roundabout route to Utah mills and smelter. The added freight rate made shipment of lower-grade ore prohibitive. Steps to clear up the traffic problem were in progress in late-1929.

RICO MINING & REDUCTION CO., THE

COLORADO

Described in Vol. XVII. Company acquired the property of now defunct Rico-Wellington Mng. Co. in early-1929 and soon after was itself taken over by St. Louis Smelting & Refining Co., which see.

RITO SECO GOLD MINE

COLORADO

Mail returned from 811 Merchants National Bank Bldg., Los Angeles, Calif. Fifty-one per cent of stock formerly owned by now defunct Mohave Gold Mining Co. of California.

Property: about 800 acres, patented, near San Luis, in Costilla county.

Development: shafts, tunnels, crosscuts and drifts, claimed to have proved 5,900,000 tons of ore which were to be mined by steam shovel and treated in a flotation plant, to have a capacity of 1,250 tons daily.

Idle since 1921-22, owing to high costs. Presumably dead.

RIVER SMELTING & REFINING CO.

COLORADO

Affiliated with National Lead Co., 722 Chestnut St., St. Louis, Mo.

Works address: H. H. Utley, mgr. and ore purchaser, Florence, Colo.

Organized about 1913 jointly by National Lead and Stone & Webster, of Boston. Operated a custom zinc smelter at Florence, Fremont county, for treatment of complex Colorado ores, until late-1927 when, according to report, operations were discontinued. Fully described in Vol. XVII.

RIVER VIEW LEASING CO.

COLORADO

Mail returned from Creede, Mineral Co., Colo.

Property: River View silver mine at Creede, operated in 1920; but no information since.

ROANOKE MINING & MILLING CO.

COLORADO

Mail returned from 221 Foster Bldg., Denver, Colo.

Officers: E. LeN. Foster, pres.-treas.; F. G. Warden, v. p.; W. C. Johnston, sec.

Inc. in Colorado. Cap. \$100,000; 10c. par; all outstanding.

Property: 11 patented claims, includes the Cleveland Tunnel, at Grant, Clear Creek county, showing gold, silver, bismuth, and lead ore in a fissure vein in granite, reopened after 20 years. Ore is a sulphide almost 2' wide, and runs N. 60° E.; said to assay 10 to 2,000 oz. silver, 30% lead, and 0.2 oz. gold per ton.

Development: by tunnel 1,500' long, and total of 3,600' of workings.

Company was active 1919-20 but idle in 1921. In 1922, the Cleveland tunnel cut the Treasure Vault vein and it was being developed in 1923; no information since.

ROBERT E. LEE LEASING CO.

COLORADO

Presumably out of business; see what is said under Robert E. Lee Mine.

Comment: the objective announced by the company president in 1926 "to bring under one operation practically the entire Breckenridge district" has been brought much nearer attainment by the recent large acquisitions.

RUBY CONSOLIDATED DEVELOPMENT CO. COLORADO
Address: C. F. Winter, Melrose Highlands, Mass. Mine address: Irwin, Colo.

Officers: Albert Sutcliffe, pres.; W. G. Fisher and C. A. Lapworth, v. p.; C. F. Winters, sec.-treas.

History: incorporated April 9, 1919, in Maine.

Capitalization and dividend record: CAP. \$1,000,000; 50c. par; which includes \$500,000 com. and \$500,000 12% cum. pfd.; \$309,812 com. and \$12,113.50 pfd. outstanding. On Oct. 16, 1924, Company voted to retire the common stock and issue pfd. in its place, without disturbing the original capitalization of \$1,000,000. DIVIDEND: 2% was paid on pfd. on March 1, 1925, and initial of 2% on com. was paid Dec. 15, 1923; none since. Transfer agt., Liberty Trust Co., Boston. Annual meeting, 2nd Wed. in January.

Property: 10 claims (2 patented), includes the Ruby Cons. No. 7, in Elk Mtn. district, Gunnison county, at Irwin, near Crested Butte, ore carrying silver, with some gold. Equipment: includes steam power and Ingersoll-Rand compressor.

Comment: company is primarily interested in oil. The mining properties have been idle since 1920, although it was reported operations were to be resumed in 1929.

RUUTTILLA-BROWN LEASING CO. COLORADO
Address: Ophir, Colo. Operated the Carbonero mine in San Miguel county, in 1920-23, now being operated by Ophir Carbonero Mines Co., which see.

RYAN MINING CO. COLORADO
Address: Vincent M. Ryan, Box 86, Idaho Springs, Colo.
Officers: H. J. Wagner, pres.; Geo. L. Bauer, v. p.; Vincent M. Ryan, sec.-treas.

Inc. Jan. 26, 1926, in Colorado. Cap. \$100,000; \$1 par; non-assessable; 50,000 shares outstanding.

Property: 6 patented claims, 100 acres, including Ivanhoe, Ben Harrison and Ryan mines in Gilpin and Clear Creek counties, near Idaho Springs. Ore carries gold, silver, copper, lead and zinc in fissure veins in porphyry and gneiss. Developed by 3 tunnels to a depth of 1,300'. Examined by Charles Glasgow and Charles Jordan.

In mid-1929, company was attempting to finance the building of a mill by sale of stock.

SACRAMENTO GOLD MINING & MILLING CO. COLORADO
Address: Box 178, Colorado Springs, Colo. Mine address: D. C. Wana-maker, Cripple Creek, Colo.

Officers: D. P. Strickler, pres.; Wm. Lennox, v. p.; Wm. Lloyd, sec.-treas., with J. H. Weimer and Tyson S. Dines, directors.

History and capitalization: INC. 1921 in Wyoming, as a reorganization of the Sacramento Gold M. & M. Co. CAP. \$10,000; 1c. par; all issued; controlling interest being held by W. S. Stratton Estate, which pays all carrying charges except taxes. Old company shares were exchangeable for new stock, share for share. On Dec. 1, 1925, company had \$965 cash balance.

Property: the Sacramento, Midnight and Last Chance claims, 9 patented acres, at Cripple Creek, Teller county, intermittently under lease during past 20 odd years, company itself never having operated. Property is considered to be fairly well located and has not been fully developed.

SAGUACHE EAGLE MINING CO. COLORADO
In 1925 property at Villagrove, Colo. was taken over by the Clary Mng. Co. of Iowa, which see.

ST. ELMO MINING CO. COLORADO
Address: Montezuma, Colo. Property: the Liberty Bell and Mark Twain mines at Montezuma, Summit County. Ore carries gold, silver and lead. Operating 1920-22; presumably idle since.

ST. JOHN MINES (COLORADO), LTD. COLORADO
Address: Williamson & Nicholas, Ltd., sec., 38 Broad St. House, London, E. C. 2, Eng. Directors: Geo. A. Williamson, chairman; J. O. Shepherd and M. M. Dewar.

Inc. Feb. 13, 1913. Cap. £75,000; 5s. par; all issued and fully paid.

During 1917 the company's property was sold to the Montezuma Silver-Lead Mines, Ltd., for £55,000 in stock, out of which the mortgage debt was discharged. This is now only a holding company, of which the chief asset is 40,000 ordinary shares of the Montezuma S.-L. Mines, Ltd. Fully described in Vol. XIV.

ST. JOHN MINING CORP. COLORADO
Address: T. B. Burbridge, American Natl. Bank Bldg., Denver, Colo.
Mine address: Walter Head, supt., Montezuma, Colo.

Company operated the mine and mill of the Montezuma Silver-Lead Mines, Ltd., (q.v) in 1926 and 1927. Presumably dead.

ST. LOUIS INDEPENDENT SMELTING & REFINING CO. COLO.
Address: O. E. Buder, sec., 500 Buder Bldg., St. Louis, Mo. Mine address: Ouray, Colo.

Officers: G. A. Franz, pres., Los Angeles, Calif. O. E. Buder, sec.-treas.

In early-1926, this company took over Z. A. D. B. Mng. Co's lease on the Bachelor-Khediye mine of the Bachelor Cons. Co. (q. v.) and some claims to the east of Bachelor property. In December, 1926, after spending over \$100,000 for development work, mining machinery and mill building and equipment, the company discontinued operations. The company apparently operated part of the year 1928 and 1929, with a small force.

ST. LOUIS SMELTING & REFINING CO. COLORADO
Subsidiary of National Lead Co.

Address: Edw. J. Cornish, pres., International Life Bldg., St. Louis, Mo.
Mine address: D. M. Kleine, supt., Rico, Colo.

Property: (a) the Cocomongo-Bonanza groups formerly operated by the Cocomongo Mines Co. (q. v.), and now defunct Kerber Creek Mng. Co., at Villagrove, Bonanza (Kerber Creek), district, Saguache county, shows ore carrying silver, lead and copper, with some gold. Developed by shafts, and a winze sunk on the 400' level. Equipment includes 450 cu. ft. compressor and 50-ton table and flotation concentrator.

(b) also acquired in early-1927, the entire property of the now defunct Rico Mng. & Ref. Co. including the Silver Swan, Wellington, Mountain Spring and Pigeon mines, in Dolores county, at Rico. Ore contains lead, zinc and silver and occurs in flat dipping fissure veins in contact deposits along bedding planes in sedimentaries. Developed by shafts and tunnels, 200' to 2,000' long, to a depth of 800', with several miles of workings. Equipment includes electric power, compressors and pumps.

The Bonanza properties produced through 1927, but not known whether more than development work has been done since. The Rico properties have been active and producing since their acquisition. A rock slide in early-1929 on the D. & R. G. Ry., and not opened during 1929, cut off the direct route to Utah mills and smelter and curtailed production to ore of sufficiently high-grade to stand the extra freight on shipments via Durango.

The company operated the Hidden Treasure mine at Lake City, Hinsdale county part of 1926. It also operates in Illinois and Oklahoma, which see for further details.

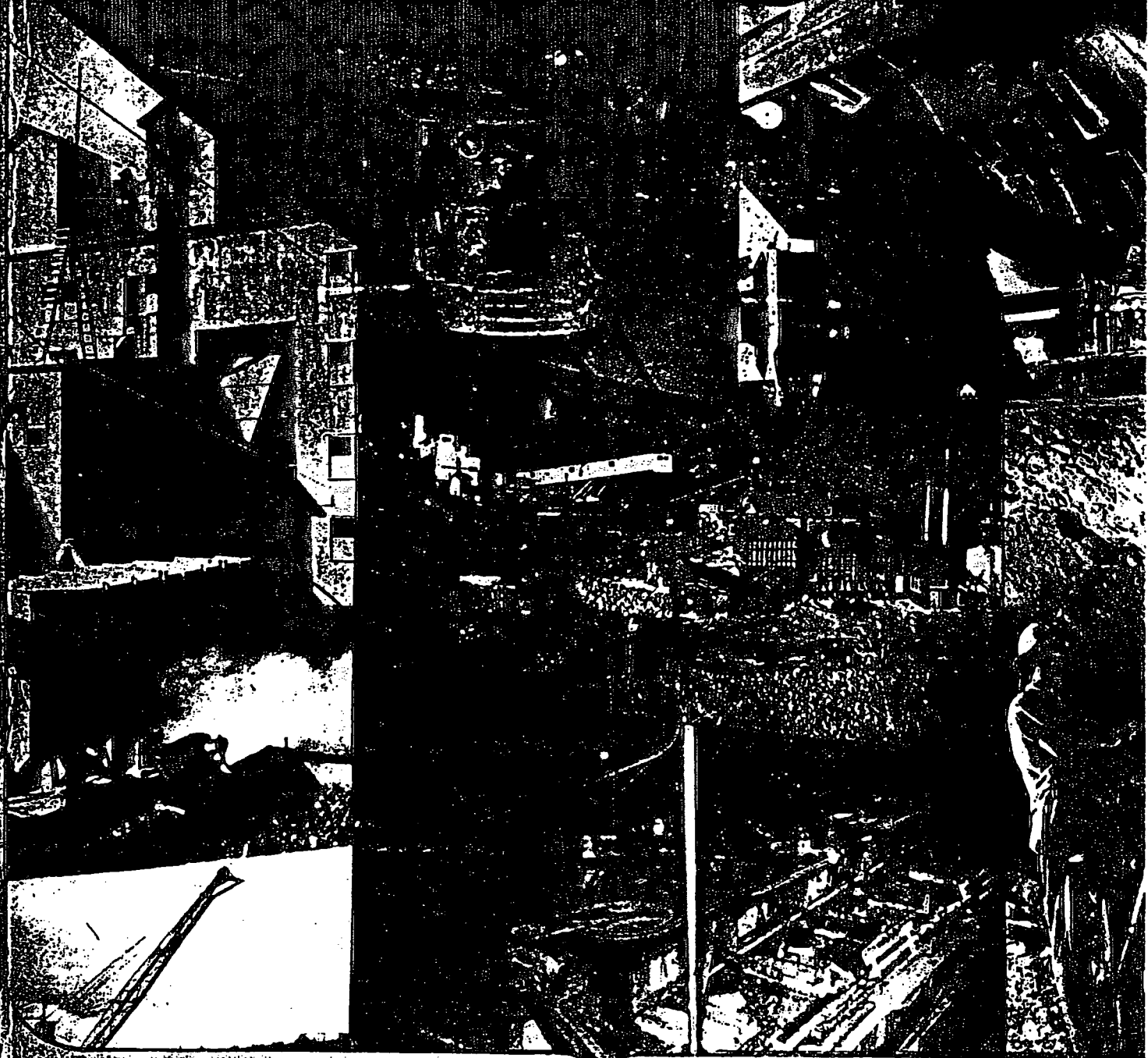
ST. PAUL MINING & REDUCTION CO. COLORADO
Address: Frank L. Ross, sec., Gas & Electric Bldg., Denver, Colo.
Norwood Johnson, pres.-treas.; J. B. Ross, v. p.-gen. mgr.

Inc. March, 1908 in Colorado. Cap. \$100,000; \$1 par.

Property: St. Paul group, in Eureka district, San Juan county, near Red Mountain.

Development: by 300' shaft, with levels at 200' and 300', developing small but rich ore shoots, said by former management to carry 8% copper,

MILITARY YEAR BOOK



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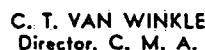
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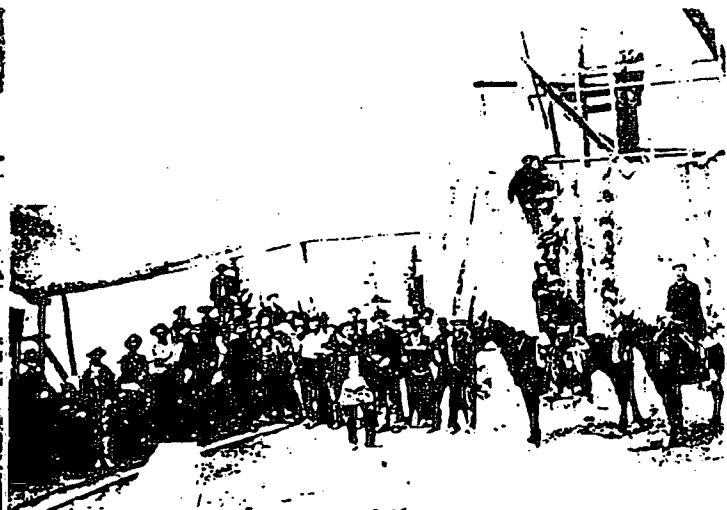
Producing mines near Rico during 1897 included the Iron Mine, Enterprise, Rico Aspen, Logan, Wellington, Black Hawk, Princeton, Swansea, Emma (Dunton), Argonaut, and eighteen smaller pro-

Miners of 1887—Enterprise shaft—Rico, another view.



Rico, Colorado about 1900.

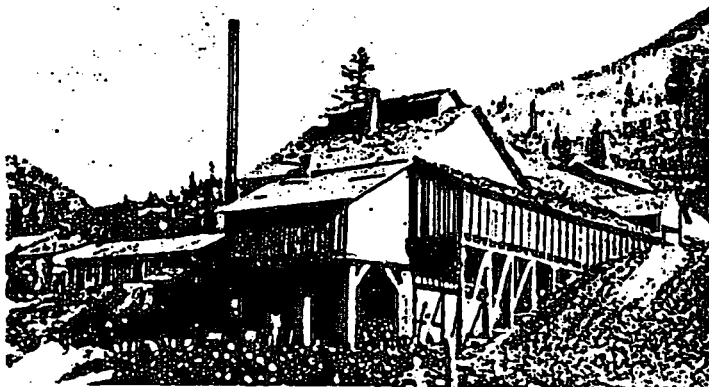
In this year also, the celebrated Enterprise-Rico Aspen dispute over the Vestal ground was settled by the United States Supreme Court in favor of the Enterprise Company. However, the ore in the ground under dispute had been largely mined out during the litigation by the Rico Aspen Company. President of Rico Aspen at this time was David H. Moffat, the Denver Banker. In this case, it was held that the Jumbo No. 2 vein, first discovered in the Group tunnel, driven by the Enterprise Company, was Enterprise property where it passed into the patented ground of the Vestal claim, which was owned by the Rico Aspen Company. This decision culminated five years of disagreement, featuring raids by the rival companies into the disputed ground, blasting down haulageways and airways, and burning of sulphur in the airways to drive out the opposition, as the two mines were connected in the Vestal ground.





Scenes of a West That's Gone

Many changes have occurred in America's West since these pictures were taken more than a half century ago. The photographs, which are the property of Alfred C. Kelly of Fort Collins, O., show two scenes in Rico, a town in the gold and silver mining region of Colorado. In the picture ABOVE two men are shown loading ore on a horse-drawn wagon. The picture BELOW shows a large pile of ore in front of a company's smelter. In 1906, the year in which the pictures were taken, the town of Rico had a population of 1,000. The pictures were taken in 1906.



Reading from top to bottom: Scene in Rico 1896. Rico Float at Spanish Trails Fiesta (John Sharer). Grand View Smelter (Rico) 1886. Lizard Head Peak and Mt. Wilson.

By 1900, most of the extremely high grade silver ore had been extracted from known deposits of the district, and the only shipments being made were occasional carload lots from small leasing operations. In this year, B. N. Griffin, a Connecticut button manufacturer, built the Pro Patria aerial tram, and the Pro Patria mill, in the Rico townsite, to handle ores from the Jumbo 3 vein. Dr. Henry F. Campbell of Boston organized the Rico Mining and Milling Company about this time and in 1901 shipped approximately 1,000 tons of zinc concentrates magnetically concentrated from Atlantic Cable zinc ores to the Vielle Montagne Zinc Works, in Antwerp, Belgium. In 1902, nearly all the mines in the district except those on C. H. C. hill were consolidated in the United Rico Mines company, under the leadership of David H. Moffat, chairman of the Board, Samuel Newhouse, Vice President, and A. B. Roeder, President and General Manager. Some work was done on the Atlantic Cable mine, and some experimental concentration carried out on the Atlantic Cable zinc ores, but the operation was more promotional than operational, and little production resulted from the consolidation. Mr. Roeder conducted the affairs of the company in a grand manner; he had a private train when he traveled to New York, and the company sponsored many civic enterprises, such as the 24-piece United Rico Band, which serenaded Mr. Roeder as his train would return from New York with a group of the company's stockholders. It is regretted that underground operations were not prosecuted with equal vigor.

In 1906, after several years of spasmodic activity, United Rico Mines began to give leases on property owned by the company, and Lessee J. D. Adams, a Rico merchant, began shipping about 400 tons per month of oxidized lead-zinc ore from the Blackhawk. The Pro Patria mill operated on this ore during the latter part of the year. During 1907, the Blackhawk lease was continued, the Pro Patria Mill was remodeled and running on Pro Patria and Ute vein Newman Hill ores, and construction was started on the Group Mill. David Swickheimer, the ex-millionaire of Newman Hill, was doing development work on the Wellington and Mountain Springs properties on C. H. C. hill, and in the Puzzle mine in Horse Gulch. J. D. Adams, Blackhawk lease-holder, unwatered the Argentine shaft, sunk fifteen years previously by Peter Fassbinder, and opened up the middle Hermosa limestone replacement deposits in an area which is still being developed and exploited. A. E. Arms, a surveyor, and F. A. W. Day made some production from the Silver Swan property on Expectation mountain, and J. W. Burns developed considerable medium grade ore in the Rio Dolores property two and one half miles above town but no shipments were made from the Rio Dolores at this time. The panic late in the same year shut down everything in camp, excepting a few individual leases. During this 1906-07 period the Emma, Almont, Americus, Smuggler and Rosebud were working gold-quartz deposits in the Dunton district; a 20 stamp mill was operated on the Smuggler Almont ores by the Mt. Gorum Mining and Milling Company, a Milwaukee Concern.

In 1911 United Rico went into receivership, and was reorganized to form the Rico Mining Company. In 1915 the Rico Mining Company went into receivership again, and came out the Syndicate Mining and Milling Company. The Rico Argentine Mining Company first entered the camp in 1912, when a lease and option was obtained by this company from the Rico Mining Company, on the old Blackhawk property. The Rico Argentine Mining Company was headed by Fred Price, of Salt Lake City. The Rico Wellington Company, with mines on C. H. C. Hill, leased the Pro Patria mill in 1912 and employed General Engineering Company of Salt Lake City to remodel it, replacing Huntington mills with rolls, and installing jigs and tables. About 75 to 100 tons of Wellington lead-zinc ore per day were milled for the first six months of the year. The Rico Argentine leased the mill for the latter half of the year, milling about the same daily tonnage. These two operations shipped a substantial tonnage of ore up to 1919, when the bulk of the district's production for this year was mined by the Marmatite Mining and Milling Company, a small leasing operation shipping about 400 tons a month from the Blackhawk and other mines.

In the summer of 1914 considerable excitement was aroused when Shellhamer Brothers and Dick Batchelor, leasing on the Pro Patria, discovered a small streak of very high grade gold ore. The

"picture rock" did not continue, however, and a small production ended the "big Strike."

During the first World War period the Calico Peak Alunite deposits at the head of Horse Gulch created considerable interest for the alumina and potash content. A million dollar offer for the locations was refused at that time. The Horse Gulch area also experienced quite a prospecting campaign under the direction of Prof. John W. Prout, who was determined to solve the puzzle. However, after a shaft was sunk, and numerous drifts and crosscuts driven in the hope of picking up the lost Puzzle vein of high grade silver ore, the campaign which was started in 1915 was finally abandoned, without success in 1918.

The largest shippers from the district in 1920 and 1921 were the Rico Wellington group, operating the General Sheridan, Iron Rod and other claims. This Company continued to be the district's largest producer through 1922 and 1923, followed by the Falcon and Yellow Jacket mines on Nigger Baby hill, which shipped about 1,000 tons of lead-copper silver ore in 1923. The Falcon and Nigger Baby groups were obtained in 1923 under lease and option for \$100,000 by R. L. Pellet of Rico, from the Syndicate Company.

Gross value of production diminished from \$64,311 in 1923 to \$24,220 in 1924. Producing mines during 1924 were the Emma mine at Dunton, and the C. V. G., Nora Lilly, Falcon, and Yellow Jacket in the Rico District. A total of 562 tons was shipped during the year. During 1924 R. L. Pellet took a lease and option for \$75,000 on the Newman Hill and Shamrock groups, including the Pro Patria Mill and the Atlantic Cable mine, from the Syndicate Mining and Milling Company. These properties were turned over to the Pelleyre Mining and Milling Company, a subsidiary of International Smelting Company of Salt Lake City. The Yellow Jacket, Falcon and other mines on Nigger Baby Hill were grouped into the Falcon Lead Mining Company. Prominent stockholders were R. L. Pellet, E. T. Telft, and others.

Production for 1925 increased to \$353,563, due to the entrance into the district of four strong companies, namely: Pelleyre Mining Company (International Smelting), Rico Argentine Mining Company, Falcon Lead Mining Company, and the Rico Mining and Reduction Company. The Rico Mining and Reduction Company obtained the Silver Swan mine from Day Bros. and A. E. Arms, the Argentine Shaft, and the Rico Wellington property from the Knight Investment Company of Salt Lake City. Stanley Walker was General Manager of the Rico Mining and Reduction Company. Operating mines during 1925 included the Emma (Dunton), C. V. G., Buckhorn, Atlantic Cable, Shamrock, Yellow Jacket and Falcon Group, Rico Argentine, and Union Carbonate. A small tonnage of lead smelting ore was shipped to the Durango smelter (A. S. & R.), and lead-zinc ores were shipped to selective flotation mills at Midvale (U. S. S. & R. Co.) and Tooele, Utah. A substantial reduction in freight rates from Rico to Salt Lake City was brought about at this time by the International Smelting Company. This was a contributory factor to the increased production of the district this year.

Further increases in production were registered during 1926, to bring the total gross value of ore shipped during that year to \$990,281. Lead-silver carbonates were produced from the Union Carbonate, operated by George E. Collins, and the Lillia D., operated by the Rico Mining and Reduction Company. Lead-zinc ores were being produced by the Yellow Jacket property; the Rico Mining and Reduction Company's Argentine shaft, Silver Swan, Lillia D., Lucky Boy and Rico Wellington mines; Pelleyre Mining Company's Shamrock; and the Rico Argentine Mine. The Rico Argentine Mining Company produced 5170 tons, gross value \$118,393. This company had been idle from 1920 to 1926 due to apex litigation with the Rico Consolidated property, owned by the Jesse Knight Investment Company of Salt Lake City, but a settlement was reached and production resumed in 1926. Shipments were made to the International Smelting Company flotation plants at Tooele, Utah, and to the Combined Metals Reduction plant at Bauer, Utah. The old Pro Patria mill in Rico was remodeled and converted to a 225 ton custom flotation mill in October of this year by the International Smelting Company, and ores from most of the major producers of the camp were treated.

The International mill operated intermittently for about two years. Largest producer for the mill was the Rico Argentine Mining Company, followed by the Falcon Lead Mining Company, the Rico Mining and Reduction Company—and its successor, the St. Louis Smelting and Refining Company—Pelleyre Mining and Milling Company, and the Rico Enterprise Mining Company. The Rico Argentine Mining Company derived its ore from the Black Hawk group, through the Log Cabin and Argentine adits. This company declared a dividend of \$24,000 in 1927. Falcon lead produced their ore from the Yellow Jacket, Nora Lilly and Falcon, on Nigger Baby Hill. Rico Mining and Reduction Company operated the Lillia D., Silver Swan, Maggie group, Iron Group, and Argentine shaft group until May, 1927, when all its holdings were transferred to the St. Louis Smelting and Refining Company (a subsidiary of National Lead). At the time of this purchase the Baer Brothers and others, of Rico, were driving a prospect heading in the Mountain Springs mine on a lease. Upon pressure being brought to bear, they sold their lease to the St. Louis Smelting and Refining Company for \$16,000. The heading was continued under the new owners, and struck a fine ore body but a few feet from where the leasers left off. This body of ore was said to have produced about \$300,000. Pelleyre ore came from the Shamrock property. Rico Enterprise derived their ore from the Jumbo 3 and Eureka veins. The former Rico Wellington property was operated by the Rico Mining and Reduction Company, and later by the St. Louis Smelting and Refining Company. About 1600 feet of development was done in 1927 in the old Union Carbonate mine, and some production of oxidized lead ore made during the year. Some development was done on the Buckhorn property and the Badger and Hidden Treasure adits; and the Rico Ventura Mining Company performed 465 feet of development work on the A. B. G. and C. V. G. groups (formerly the Rio Dolores property). Some maintenance and development was performed during 1927 at the Emma and Smuggler-Almont mines in Dunton, but no production ensued.

Total gross mine production of Dolores County for 1927 (All from Rico) was \$1,432,554.

Production held up well through 1929, in which year the camp's total production was about 32,000 tons, of which the Rico Argentine mined about half, and the St. Louis Smelting and Refining Company, Rico Enterprise Mining Company, Union Carbonate, and Falcon Lead produced the remainder.

From 1929 to 1930, depressed metal prices caused the cessation of most active company-account operations in the district, except the Rico Enterprise which continued operation on the Pro Patria for several years on the high-silver fissures, which with small leases by local residents, kept them going. In October, 1930, the St. Louis Smelting and Refining Company started the St. Louis Tunnel into the base of C. H. C. Hill, to prospect the formations below the Mountain Springs level, and to provide a haulageway for the Mountain Springs, above. This tunnel was driven into the hill for about 5150 feet. Unfortunately, ore developed by this ambitious undertaking was not up to expectations, and after a few more years, this company suspended all operations in the district, relinquishing all their Rico interests in 1943. The International Smelting Company retained their interests in the district, chiefly the Newman Hill, Atlantic Cable and Shamrock mines, until 1941, when they gave up their options.

Control of the Rico Argentine Mining Company, operating the Blackhawk and other early producers, was obtained in 1937 by Mr. J. A. Hogle of Salt Lake City. The adjoining Rico Consolidated property was purchased and the Argentine shaft properties were also opened on a lease basis. The financial structure was revamped, a development campaign was commenced this year and a 135 ton selective flotation lead-zinc mill built in 1938, near the mine, all under the direction of C. T. Van Winkle, general manager. A few months after completion of the mill, production of 3000 tons per month of lead-zinc ore was begun, and has continued without interruption up to the present day. The ore bodies of the Rico mines are small to medium sized, and a persistent program of exploration and development has been necessary to develop new ore bodies as the

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old ones are worked out. Development of the Rico Argentine group of properties has continued, and in 1942 the Pelleyre properties in the Rico Townsite area and Newman Hill were acquired; the Pro Patria and Revenue Tunnels in this group were reopened, with consequent small production up to the present time. The Van Winkle shaft was sunk 300 feet to the Devonian limestone beneath the Rico townsite, in 1942, to develop lead-zinc replacement ore bodies known to exist in this formation in the Atlantic Cable, Shamrock, and other mines. At the present time, over half of the Rico Argentine Mining Company's production is hoisted through this shaft. In 1943 the St. Louis Smelting and Refining Company withdrew from the district, and their properties were acquired by the Rico Argentine Mining Company. The St. Louis Tunnel and Mountain Springs mine, of this property, are now being re-opened, and some development has been begun to put the property back into production. In addition, the Rico Argentine Company has taken a lease and option on the Falcon group of properties on Nigger Baby Hill, and the Larsen Tunnel is being driven into the base of the hill to develop ore-bearing horizons of this group at depth.

At the present time one company, the Rico Argentine Mining Company, under the management of C. T. Van Winkle, President and General Manager, is the only producer of the camp. Annual production for the years 1939 to 1946 follows:

Year	Tons Crude Ore Milled		AVERAGE ASSAY				
	Copper	Lead-Zinc	Oz. Gold	Oz. Silver	% Lead	% Zinc	% Copper
1939		10,673	.012	3.83	8.46	11.23	1.06
1940	7,895		.02	7.02	1.00	1.45	4.97
		23,824	.015	4.25	7.45	10.29	.84
1941		35,720	.001	3.60	8.3	10.4	.25
1942		34,735	.001	3.66	7.85	10.47	.18
1943		33,765	tr.	5.81	10.23	15.94	.26
1944		36,558	tr.	5.16	9.86	17.2	.28
1945		35,796	tr.	4.885	7.779	14.77	.18
1946		35,711	tr.	4.97	6.89	13.67	.20
	7,895	246,782					

It may be noted that since the beginning of the war many Navajo Indians have been employed in the mines in various capacities and during critical manpower shortage, have done much to relieve the situation.

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MINERAL RESOURCES OF THE UNITED STATES

1927

FRANK J. KATZ

Chief Engineer, Division of Mineral Statistics

PART I—METALS



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milled at the Wasatch-Colorado jig and table mill, yielding a few tons of lead-silver concentrate and a few tons of zinc concentrate not sold). A car of lead ore carrying also zinc, was mined from the Dunkirk-Payrock group and milled at the Rose City No. 2 mill, yielding a lead-silver concentrate. Several hundred tons of lead-zinc-silver ore from the Clara B mine was milled at the Georgetown Tunnel Transportation Co.'s flotation-gravity concentration mill, yielding a lead-zinc concentrate, the zinc of which was lost in smelting. The Wasatch-Colorado jig and table concentrating mill was operated for a short period, but the lead and the zinc concentrates produced were not marketed in 1927, awaiting a higher metal market. Other small producers were the Buster, Capital, Cyclone, Daniel Peters, East Griffith, and Mammoth. At the Mineral Chief property (opened by a 2,000-foot adit) 200 feet of drifting, 250 feet of crosscutting, and 55 feet of winzing were done. The St. George 60-ton flotation mill was idle, but development work was done at the mine.

Idaho Springs district.—Twenty-one mines in the Idaho Springs district produced 4,104 tons of ore, yielding \$48,264 in gold, 11,956 ounces of silver, 16,381 pounds of copper, and 68,190 pounds of lead, with a total gross calculated value of \$61,485 as compared with \$86,897 in 1926. The largest producing property was the West Gold, from which gold telluride and free gold ore were shipped to the Golden Cycle mill at Colorado Springs. The next largest producing property was the Specie Payment, from which gold smelting ore was sold to the Idaho Springs sampler and gold milling ore was treated at the Newton gravity concentration-flotation mill at Idaho Springs. Gold ore from the Treasure Vault mine was sold to the Golden Cycle mill; small test lots went to the Combination mill and to the Elliott-Barber mill, both at Idaho Springs. Some gold ore from the Elliott-Barber mine was sold to the Golden Cycle mill and some was treated at the company's own concentration mill. The North American Mining Co.'s Central (or Big Five) 9,454-foot crosscut adit was placed in operating condition by removing the fallen rock, retimbering where necessary, relaying new rails, and repairing ore cars, power house, and motors so that custom tramming could be done and air furnished for ventilation and for power for drills and hoists at the Lake mine. In addition, lessees operated the North American's own veins—the Edgar, the Bald Eagle, and the Fulton. The lessees' ore consisted of dry gold and silver ore, which was sent to the Newton mill, and of dry gold and silver and lead-silver-gold-copper smelting ore. Lead-copper-silver-gold and dry gold and silver concentrates were produced. No production was made from the Lake mine, but 1,200 feet of drifts, 200 feet of crosscuts, and 190 feet of raises were driven between January 12 and September 30, 1927. Other producers were the Almaden, Lincoln, Little Mattie, Lord Byron, May Day, Maud Monroe, and P. T.

Montana district (Lawson, Dumont).—Five mines in the Montana district produced 340 tons of ore, yielding \$115 in gold, 5,349 ounces of silver, and 26,698 pounds of lead, with a total gross calculated value of \$4,830 as compared with \$39,586 in 1926. Producing mines were the Bellevue-Hudson, De Caprivi, Jo Reynolds, Millington, and Senator.

Trail Creek district (Lamartine, Freeland).—The Trail Creek district produced 376 tons of ore, yielding \$2,395 in gold, 1,125 ounces of

silver, 313 pounds of copper, and 52,238 pounds of lead, with a total gross calculated value of \$6,365 as compared with \$14,253 in 1926. Lead-gold-silver smelting ore was shipped from the Brighton, Crazy Girl, Neglected, and New Era; gold ore was shipped from the Donaldson-Wheatland and Puckett to the Golden Cycle mill. At the New Era mine retimbering, cleaning out cave-ins, and relaying track and air lines was begun in February, 1927. The mill was repaired and was operated during June and to July 15 on a test run. The ore is crushed to $\frac{1}{4}$ inch; it then goes to rolls and to jigs; tailings from jigs go to regrind and to tables. The concentrates produced were lead-gold-silver. Development work at the New Era totaled 225 feet of drifts; at the Crazy Girl, 200 feet of shaft sinking and 3,000 feet of drifts; and at the Neglected, 100 feet of drifts. The Freeland mine and mill were idle.

CONEJOS COUNTY

Platoro district (Ute, Decatur).—Assessment work was continued in the Platoro district, a producer from 1882 to 1906.

CUSTER COUNTY

Hardscrabble district (Westcliffe, Silver Cliff).—Several small lots of highly siliceous silver ore were shipped in 1927 from Westcliffe, from the Black Friday, Maxine Elliott, and S. A. K. groups. The new shaft on the Passiflora mine was continued to 280 feet and drifts run, but no ore was shipped.

Oak Creek district (Ilse).—At the Terrible mine at Ilse, 23 miles from Florence, development work amounted to 2,587 feet in 1927. The ore, a low-grade lead ore containing cerussite without gold, silver, or other metals, was concentrated as theretofore by Wilfley tables and Harz jigs. The high-grade lead concentrate produced was as usual sent to the Eagle-Picher Lead Co., at Joplin, Mo.

DOLORES COUNTY

The total gross calculated value of the mine production of metals in Dolores County in 1927 (all from Rico) was \$1,432,554 as compared with \$990,281 in 1926, \$353,563 in 1925, and \$24,220 in 1924.

With the exception of lead-silver smelting ore from the Pigeon, Shamrock, and Union Carbonate mines, all the ore mined was complex lead-zinc-copper-silver-gold-iron sulphide milling ore, which was treated at the International custom selective flotation plant at Rico. This 225-ton plant began operations October 1, 1926, and operated for nine months in 1927.

The milling ore came from various properties under various ownerships and various options and leases. The largest production was from the Rico-Argentine, followed by the Falcon Lead Mining Co., the combined output of the Rico Mining & Reduction Co. and its successor, the St. Louis Smelting & Refining Co., the Pelleyre Mining & Milling Co. (subsidiary of the International Smelting Co.), and the Rico Enterprise Mining Co.

The Rico Argentine Mining Co. mined its ore from the Black Hawk group, through the Log Cabin, Argentine, and Blaine adits. This company declared a dividend of \$24,000, or \$0.03 per share, on January 1, 1928. The property was in litigation for six years prior

MINERAL RESOURCES, 1927—PART I

, but a settlement was reached in December, 1924, and mining operations began in January, 1925. Shipments of lead-zinc ore to began in August, 1925. The Falcon Lead Mining Co. mined from the Nigger Baby Hill (or Yellow Jacket) group, upon 878 feet of raises, 1,788 feet of drifts, and 1,287 feet of crosscuts were driven in 1927. The Rico Mining & Reduction Co. operated the Lillie D. Silver Swan, Maggio group, Iron group, and Pellevre Mining & Milling Co. mined its ore from the Shamrock claim, upon which 190 feet of raises, 319 feet of drifts, and 425 feet of crosscuts were driven in 1927. The former Rico Wellington group was operated by the Rico Mining & Reduction Co. and the Lillie D. Silver Swan, Maggio group, Iron group, and Pellevre Mining & Milling Co. The Union Carbonate Co. was operated by the Rico Mining & Reduction Co. and the Lillie D. Silver Swan, Maggio group, Iron group, and Pellevre Mining & Milling Co. The mine is opened by various adits; the old vertical shaft has caved; about 1,600 feet of drifts, raises, inclines, and crosscuts were driven in 1927; the ore is oxidized, and the minerals are cerussite, anglesite, limonite, and a little minium, plumbogarsite, and smithsonite; sorting by hand and close selective mining were used. At the Badger group drifting and crosscutting amounting to about 150 feet were done under lease and option until the termination of such on March 1, 1927; the group is opened by the 700-foot Badger adit and by the 510-foot Hidden Treasure adit to the old Sunflower shaft, from which several hundred feet of drifting had previously been done. Ore was produced from the A. B. G. and C. V. G. groups, upon which the Rico Ventura Mining Co. drove 325 feet of drifts, 40 feet of raises, and a 100-foot shaft. The Buckhorn group is opened by an adit 1,500 feet long with several hundred feet of laterals; parts of the tunnel were retimbered and 200 feet of new drifting was done; this property was once opened by the Sawyer shaft, said to be 236 feet deep, now caved and inaccessible. The International Smelting Co.'s Rico mill, installed in 1926 in the old Pro Patria mill building (with additions), began operations in October, 1926. Ore is brought to the mill by team and truck. Crushing is done by an 18 by 24 inch Blako crusher, by 42 by 16 inch Taylor rolls, and by an 8-foot by 36-inch ball mill. Other equipment includes one 10-foot Dorr drag classifier, two Minerals Separation 14 cells each) flotation machines, one American 6-leaf filter, and two 25 by 9 by 11 redwood thickening tanks. The mill was idle in June, July, and August, owing to low market prices for lead and zinc and pending the making of new contracts. Dunton district.—At the Emma mine at Dunton retimbering was done and flotation cells were added to the 15-stamp mill, but no ore was treated in 1927. At the Smuggler-Almont mine 232 feet of drifts and 55 feet of crosscuts were driven; the 20-stamp concentrating mill on this property has been idle for 15 years.

DOUGLAS COUNTY

Newlin Gulch district (Parker).—Pipes were laid for pumping water from the stream bed of Newlin Gulch to the west bench of the Rock conglomerate has been dug in the nearly flat-lying and small sluicing

GOLD, SILVER, COPPER, LEAD, AND ZINC IN COLORADO

operations, but none was marketed in 1927. Part of this area is under the control of the State Land Board, which has insisted on the sinking of shafts. This gulch and adjoining gulches leading into Cherry Creek and South Platte River furnished enough gold in 1842 and thereafter to lead the Russell party of 1858, in search of gold, from Georgia to the present site of Denver. Although the results obtained from this reconcentrated arkose were disappointing, they lured the prospectors to the region, whence they followed up the more recent (geologically) stream bed of Clear Creek and in 1859 found rich residual gold surface deposits at Blackhawk and stream and bench gravels at Idaho Springs. Henderson² wrote a history of the discovery and of the development of mining in Colorado from 1859 to 1923.

EAGLE COUNTY

Battle Mountain district (Red Cliff, Gilman).—The Empire Zinc Co. continued development work on its large area of mining property on Battle Mountain. The property is opened by an adit at Belden on the Denver & Rio Grande Western Railroad, in Eagle River Canyon, and by a vertical shaft at Belden. The Iron Mask and Black Iron groups are the chief and best-known claims included in the property. Lead-silver oxidized ore was first discovered here in 1879 in the limestone beds, and shortly thereafter gold ores were discovered in the underlying quartzite. Much manganiferous iron ore was shipped in the early days of the district. When sulphides were reached the zinc in the ore proved troublesome; in 1905, however, they were handled successfully by magnetic separation. From 1914 to 1918 much zinc-lead sulphide ore was shipped direct to zinc retort and zinc-lead pigment plants. The Empire Zinc Co. acquired part of its property between 1912 and 1914 and has since added to it. It has shipped yearly zinc-lead sulphide ore in considerable quantity (none in 1921) to its magnetic mill at Canon City and iron-silver sulphide ores to smelters in Colorado and Utah. Since October, 1927, no zinc-lead iron sulphide ore has been shipped to Canon City because of a decision to close down the Canon City magnetic plant (operated continuously since 1902 except from November, 1920, to November, 1922) and to build a flotation mill at Belden. Iron-silver sulphide ores, however, were shipped throughout 1927. Other producing mines in the Battle Mountain district in 1927 were the Ground Hog, Horn Silver, Ovee, and Tram.

Brush Creek district (Eagle).—Assessment work was done at the Lady Belle-North Dakota group. During the period 1913 to 1918 this group produced 200,000 ounces of silver from surface and shallow inclined workings in sandstone.

Fulford district.—Assessment work was done at the Polar Star group. Holy Cross district.—Assessment work was done on several claims on the flanks of Holy Cross Mountain.

Lake Creek district (Edwards).—Persistent reports since 1924 of placer gold deposits on Lake Creek resulted in the examination of the gravels by several engineers in 1927 and in the sinking of several test pits.

McCoy district.—Attempts were again made to recover placer gold from stream gravels of Colorado River near McCoy.

²Henderson, Chas. W., Mining in Colorado: U. S. Geol. Survey Prof. Paper 138, 1926, 263 pp.